

1. SMIRNOV, R.M.
2. USSR (600)
4. Agriculture
7. Suggestions of the Scientific Research Institute of Agriculture of Southeastern Russia for introduction into agricultural practice, Dost.sel'khoz. no. 5, 1953.

9. Monthly List of Russian Accessions, Library of Congress, APRIL 1953. Unclassified.

Category : USSR / Weeds and Weed Control.

M

Abs Jour : Ref Zhur - Biol. No 6, March 1957, No 22912

of fallow soil without harrowing, blue lettuce fully stopped growing. In the 1954-1955 experiment, after a single plowing, blue lettuce formed 38-43% of rosettes of their original number and European bind-weed 28-50%. In 1954 after a double plowing neither blue lettuce nor bindweed showed any growth. In 1955 they did grow, respectively, to 11% and 20%. Even when irrigated in a double plowing, blue lettuce grew only 67% and bindweed 70%. Their underground portions reserved their viability. Root-sprouted weeds emerge from their state of dormancy and grow again after the long abandoned soil is replowed and on light soils after plowing a total fallow or an early fallow.

Card : 2/2

USSR/Weed and Their Control.

N.

Ab s Jour : Ref Zhur - Biol., No 4, 1958, 15945
 Author : ~~B. M. Smirnov~~
 Inst : -
 Title : The Chemical Control of Wild Oat in the USA and in
 Canada.
 (Khimicheskaya bor'ba s ovsyugom v SShA i Kanade).
 Orig Pub : S. kh. Povolzh'ya, 1957, No 8, 92.
 Abstract : No abstract.

Card 1/1

USSR / Weeds and Weed Control

N

Ab s Jour : Ref Zhur - Biologiya, No 13, 1958, No. 58816
 Author : Smirnov, B. M.
 Inst : Scient.-Research Institute of Agriculture of the
 South-East
 Title : Chemical Control of Root-Sprout Weeds
 Orig Pub : Zemledeliye, 1957, No 10, 51-55
 Abstract : Studies, conducted at the Scientific Research
 Institute of Agriculture of the South-East and
 consisting of periodic digging in layers, measuring
 and weighing of the dry mass of underground organs
 of root sprout weeds of the European bindweed, Canada
 thistle (*Cirsium arvense*) and lettuce, showed that
 the main flow of plastic substances, with which the
 herbicides can penetrate to the depth where the
 majority of roots (0-60 cm) is situated, takes place

Card 1/2

COUNTRY : USSR
CATEGORY : Weeds and Weed Control. N
ABST. JOUR. : RZhBiol., No. 3, 1959, No. 11222
AUTHOR : Smirnov, B. M., Galsyev, N. A.
INST. : Scientific Research Institute of the Agriculture of the*)
TITLE : Destruction of Weeds on Carrot Sowings.
ORIG. PUB. : Sad i ogorod, 1958, No. 4, 25-27
ABSTRACT : The 1957 experiments of the Scientific Research Institute of the Agriculture of the Southeast (Saratov) showed the promising prospects of the use of kerosene for the control of weeds in carrot sowings, especially upon the addition to it of the wetting agent OP-7.

CARD: 1/1

*) Southeast (Saratov)

L 46326-66 EN (1)/EWT(m)/EWF(j) AT/RM

ACC NR: AT6015885

SOURCE CODE: UR/3136/65/000/M&S/G001/0044

AUTHOR: Smirnov, B. M.

ORG: Institute of Atomic Energy im. I. V. Kurchatov (Institut atomnoy energii)

TITLE: Diffusion and mobility of ions in gas

SOURCE: Moscow. Institut atomnoy energii. Doklady, IAE-1005, 1965. Diffuziya i podvizhnost' ionov v gaze, 1-44

TOPIC TAGS: ion density, gas diffusion, ion mobility *distribution*

ABSTRACT: A review of theoretical and experimental work relating to the behavior of ions in gases is presented. This review is based on a very extensive bibliography and covers the present theoretical description of the ion² motion in gases with and without applied electric fields. The experimental methods and their merits are critically discussed. The ion motion in foreign gases and in gases of the same atomic mass is covered together with an investigation of the behavior of molecular and complex ion structures in various gases. Chemical reactions are considered and various methods for determining ionic species in these gases are presented. The diffusion, mobility, and cross section data for numerous ions is presented for various temperature and pressure ranges and ion densities. These data are compared with theoretical predictions, where possible, and the discrepancies and reasons for them are indicated. Orig. art. has: 10 figures, 31 formulas, 2 tables.

SUB CODE: 20/

SUBM DATE: none/

ORIG REF: 014/

OTH REF: 0116

Card 1/1

L 41355-65 EWT(m)/EWP(s)/EWP(t) IJP(c) JD/JG

ACCESSION NR: AP5008754

S/0056/65/048/003/0939/0945

AUTHOR: Smirnov, B. M.; Chibisov, M. I.

12
B

TITLE: Electron exchange and changes in the hyperfine state of colliding alkaline-metal atoms

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 3, 1965, 939-945

TOPIC TAGS: alkaline metal, electron exchange, hyperfine state, term difference, symmetrical state, antisymmetrical state, exchange cross section, exchange interaction

ABSTRACT: The method of L. P. Gor'kov and L. P. Pitayevskiy (DAN SSSR v. 151, 822 (1963) is used to calculate the asymptotically exact value of the term difference of the symmetrical and antisymmetrical states for two alkaline-metal atoms separated by large distances. The obtained value of the term difference is then used to calculate the cross section for the exchange of electrons and the probability of variation of the hyperfine state upon collision of these atoms. It is also shown that the exchange interaction of these atoms prevails over the Van der Waals interaction even at very large distances between nuclei. "The authors are

Card 1/2

L-47365-65

ACCESSION NR: AP5008754

deeply grateful to O. B. Firsov for valuable advice and for interest in the work,"
Orig. art. has: 14 formulas and 3 tables.

ASSOCIATION: None

SUBMITTED: 03Oct64

ENCL: 00

SUB CODE: NP

NR REF SOV: 003

OTHER: 014

Card 2/2 C C

L 2113-66 EWT(1)

ACCESSION NR: AP5024705

UR/0056/65/049/003/0841/0851

AUTHOR: Smirnov, B. M.; Chibisov, M. I.

TITLE: Disintegration of atomic particles by an electric field and by electron impact

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 3, 1965, 841-851

TOPIC TAGS: electron detachment, electron affinity, negative ion, electron impact, hydrogen ion

ABSTRACT: The decay of an atomic particle in a constant homogeneous electric field is considered. An asymptotically exact (in the limit of small field strengths) expression is obtained for the probability of electron detachment per unit time. The result obtained is used for determining the binding energy of an electron for a negative helium ion (the experimental dependence of the ion lifetime on the strength of the external electric field in which it decays is utilized). The electron affinity of a helium atom is found to be 0.06 ± 0.005 ev. A calculation is made of the cross section for disintegration of a negative ion by electron impact resulting in liberation of an s-electron. It is assumed that the cross section is large compared with

Card 1/2

L 2113-66

ACCESSION NR: AP5024705

the characteristic size of the negative ion and that the impinging electron moves in a classical orbit. These assumptions are justified by the results. Two mechanisms of disintegration of a negative ion are considered: "squeezing" of a weakly bound electron of the negative ion by the static field of the impinging electron, and its removal as a result of variation in time of the field of the incident electron. It is shown that at high collision velocities the second mechanism yields a result which corresponds to the Born approximation. The dependence of the H-disintegration cross section on the velocity of the incident electron is compared with the results of other calculations. Orig. art. has: 2 figures and 32 formulas. [CS]

ASSOCIATION: none

SUBMITTED: 16Mar65

ENCL: 00

SUB CODE: NP,EM

NO REF SOV: 004

OTHER: 012

ATD PRESS: 4117

CAY 2/2

L 50530-65 EWT(1)/EPA(sp)-2/EPF(c)/EPA(w)-2/EEC(t) Pab-10/Pr-4/Peb AT
 ACCESSION NR: AP5009220 S/0020/65/161/001/0092/0095

AUTHOR: Smirnov, B. M.

TITLE: Production and decay of negative ions

SOURCE: AN SSSR. Doklady, v. 161, no. 1, 1965, 92-95

TOPIC TAGS: negative ion, charge exchange, ²¹ion production, ion decay

ABSTRACT: The mechanism described in this article differs from the one described in many papers and connected with a collision between the electron and the molecule followed by dissociation of the molecule into an atom and a negative ion. In the mechanism treated here negative ions are produced in a low temperature plasma as a result of charge exchange between an atom with an excited atom. The cross section of such a process is determined by the properties of the quasi-molecules made up of the atoms, and especially by the difference between the terms of the states corresponding to the positive and negative ions on one hand and to two atoms on the other. The cross section for the charge exchange is determined from the splitting of the terms of the two states of the molecules, corresponding to the electron situated near one of the atoms, which are an infinite distance apart.

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L 50530-65

ACCESSION NR: AP5009220

An expression is obtained for the splitting of the terms in terms of the molecular work functions of the corresponding states. The probability of charge exchange of an atom with an excited atom with formation of the negative ion is calculated by the Landau-Zener formula. The conditions under which the results obtained are valid are evaluated. "The author is deeply grateful to O. B. Firsov for valuable discussions." This report was presented by M. A. Leontovich. Orig. art. has: 6 formulas and 1 table.

ASSOCIATION: Institut atomnoy energii im. I. V. Kurchatova (Institute of Atomic Energy)

SUBMITTED: 01Sep64

ENCL: 00

SUB CODE: NP, ME

NR REF SOV: 004

OTHER: 005

me
Card 2/2

SMIRNOV, B.M.

Inelastic collisions of slow atoms. Opt. i spektr. 17
no.4:504-514 O '64. (MIRA 17:12)

TULASHVILI, N.D.; SAMUNDZHEVA, E.M.; RACHVELISHVILI, E.V.; ANTONOVA, V.P.,
dotsent; MALEZHNIK, G.M.; SMIRNOV, B.M., doktor sel'skokhoz.nauk;
MATVEYENKO, G.A., aspirantka; BALANTAYEVA, M.R.; GARNAGA, G.K.

From the practices of the use of poisonous chemicals. Zashch.rast.
ot vred. i bol. 8 no.12:28-29 D '63. (MIRA 17:3)

1. Gruzinskiy institut zashchity rasteniy (for Tulashvili, Samundzheva, Rachvelishvili). 2. Kishinevskiy sel'skokhozyaystvennyy institut (for Antonova). 3. Zaveduyushchiy otdelom zashchity rasteniy Sumskey opytney stantsii (for Malezhnik). 4. Nauchno-issledovatel'skiy institut sel'skogo khozyaystva Yugo-Vostoka (for Smirnov, Matveyenko). 5. Nauchno-issledovatel'skiy institut bogarnogo zemledeliya, Gallya-Aral (for Balantayeva, Garnaga).

S/056/62/043/001/017/056
B102/B108

AUTHOR: Smirnov, B. M.

TITLE: Inelastic collisions of light atoms in adiabatic approximation

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 1(7), 1962, 112 - 116

TEXT: The author considers inelastic scattering with small collision parameters, when the transition probabilities are determined by the matrix elements of the atom. In this case the integral corresponding to the amplitude of the transition probability can be calculated by the saddle point method. The range of applicability of this method is of the same order of magnitude as that of adiabatic approximation. It decreases rapidly as Z of the colliding atoms increases. The upper limit is determined by $E \gg ZZ_{\text{eff}}/2$ (E - nuclear energy in the c. m. s., Z - charge of the hit nucleus; for the incident nucleus $Z=1$ is assumed; Z_{eff} - charge of the system), the lower limit is $v/w \ll 1/Z_{\text{eff}}$ (w - negative level energy

Card 1/2

S/056/62/043/001/048/056
B102/B104

AUTHORS: Ivanov, Yu. M., Nikol'skiy, B. A., Smirnov, B. M.,
Surkova, L. V.

TITLE: μ^+ -meson depolarization in an electric field

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43,
no. 1(7), 1962, 337-339

TEXT: The authors studied the effect which a strong electric field ($E \sim 10^5$ v/cm) exerts on the depolarization of μ^+ mesons resulting from $\pi-\mu$ decays in photoemulsions. Depolarization of stopped muons is attributed mainly to production of muonium (μ^+e^-); it has, however, also been observed (Swanson, Phys. Rev. 112, 580, 1958) that the "stopped" μ^+ meson precessed in a transverse magnetic field and showed no further depolarization. Thus, muonium must be produced within a very short time immediately after the stoppage. It has not yet been verified by experiment whether the μ^+ meson in condensed matter decays as a free

Card 1/2

S/056/62/043/002/028/055
3104/3108

AUTHORS: Smirnov, B. M., Ivanov, Yu. M.

TITLE: The behavior of a μ^+ -meson in organic substances at low energies

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 2(8), 1962, 557-560

TEXT: The inelastic scattering of a muon on the vibrational levels of a hydrogen molecule is investigated. This is done by means of the Ψ function of a triatomic molecule with stationary nuclei; the nuclear coordinates are contained in the Hamiltonian as parameters. The total energy of the system is $E(R_{ab}, R_{ac}, R_{bc}) + T_a + T_b + T_c = \text{const}$, where the indices a and b indicate the proton, c - the μ^+ -meson, E is the energy of the triatomic molecule, T is the kinetic energy of the nuclei, and R is the distance between them. In the energy range $0.01 \leq E \leq 1$ one has $\tau_p \ll \tau_0, T_{a,b} \ll T_c$ (2) (τ_p - time of passage of the muon through the molecule, τ_0 - characteristic time of the H_2 oscillations). The inter-

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S/056/62/043/002/028/053
B104/B108

The behavior of a...

action potential is therefore $V = E_{\text{tot}} + T_c = E(R_{ab}, R_{bc}, R_{ac})$. By means of

the theory of sudden perturbations one obtains: $C_k = \int_{-\infty}^{+\infty} V_{ko}(\tau) d\tau$ (where

$C_k \ll 1$) for the amplitude of the transition probability of the molecule to another vibrational level. $V_{10} = (F_a - F_b)a_0/\sqrt{2}$ is derived for the interaction potential, so that $C_1 = a_0(\Delta p_a - \Delta p_b)/\sqrt{2}$ (4) is the amplitude of the transition probability to the first level. a_0 is the oscillation amplitude of the (harmonic) oscillator, F_a and F_b are the projections on the molecule axes of the forces acting on the protons when a muon passes, Δp is the projection of momentum. The probability amplitude can be obtained in this form also by the classical theory, provided that the conditions (2) are fulfilled. Conclusions: the particles are slowed down in a high-molecular substance mainly by the molecular oscillations (inelastic processes). The slowing-down power of a medium can be estimated

Card 2/3

45370
S/056/63/044/001/035/067
B188/B180

24,660

AUTHOR: Smirnov, B. M.

TITLE: Slowing down of protons and μ^+ mesons in metals

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44,
no. 1, 1963, 192 - 196

TEXT: A positive particle in a metal is slowed down by interaction with electrons whose spectrum is continuous. The stopping power of metals can therefore be calculated by using the model of a cold, dense plasma whose electrons are considered to be free the charge is uniformly distributed, and the electron density is constant and equal to the mean electron density in the metal. The stopping power can be expressed by the plasma properties. These are found from the Green's function by adding up the most divergent graphs of the perturbation theory in the case of $v \ll v_0$, where v_0 is the electron velocity on the Fermi sphere. The stopping power is

expressed by

$$-\frac{dE}{dt} = \frac{2}{3\pi} v^2 (1-\alpha)^{-2} \left\{ \frac{3\pi/2 + 1}{V\alpha + 1} \ln \frac{(1 + \sqrt{1+\alpha})^2}{\alpha} - 3 \right\}.$$
 (1)

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S/056/63/044/001/035/067
B188/B180

Slowing down of protons and ...

where $\alpha = 1/(\pi p_0 - 1)$, p_0 is the electron momentum on the Fermi sphere, and v the particle velocity. Series expansion with respect to the small quantity α yields

$$-\frac{dE}{dt} = \frac{2}{3\pi} v^3 \left\{ \ln \frac{4}{\alpha} - 3 + 3\alpha \ln \frac{4}{\alpha} - \frac{11}{2} \alpha \right\}, \quad (2)$$

which in the limiting case $p_0 \rightarrow \infty$ goes over into the expression by Fermi and Teller (Phys. Rev. 72, 399, 1947). Electron-electron interactions are neglected. The results are hardly affected if this interaction is taken into consideration for a plasma whose electron density is the same as that of real metals. The stopping power can be given by $-\frac{dE}{dt} = A v^2$. The table gives the theoretical and experimental A values for various metals. They are in satisfactory agreement. The time required for thermalizing μ^+ mesons is almost independent of the type of metal and is of the order of 10^{-13} sec. There is no depolarization of the meson spin. There are 1 figure and 1 table. ✓

SUBMITTED: July 6, 1962

Card 2/3

L 16894-63

EWI(1)/BDS AFFTC/ASD

ACCESSION NR: AP3005260

S/0056/63/045/002/0155/0158

AUTHOR: Smirnov, B. M.

52

TITLE: Collisions of slow heavy atoms

SOURCE: Zhur. eksper. i teoret. fiz., v. 45, no. 2, 1963, 155-158

TOPIC TAGS: slow atomic collision, continuous energy spectrum, quasimolecule, excitation, mixing of states

ABSTRACT: It is proved that the excitation of a system of slowly colliding atoms occurs in a continuous fashion, as if the excited electrons were classical and possessed a continuous energy spectrum, provided the state of the system can be represented as a combination of many characteristic states of a quasi-molecule, so that the excitation is the result of the mixing of newer and newer states of the quasi molecule and of the variation of the statistical weights of the old states. A criterion that indicates when the above excitation mechanism is realized for collisions of heavy atoms is indicated. The results confirm similar hypothesis made by Russek and Thomas (Phys. Rev. v. 109, 2015, 1958) and O. B. Firsov (ZhETF v. 36, 1517, 1959). "In conclusion, the author expresses deep gratitude to O. B. Firsov for his valuable comments and continuous interest in this work." Orig. art. had Card: 1/2 | 6 formulas.

SMIRNOV, B.M., doktor sel'skokhoz. nauk; YENENKO, I.I., aspirant

Controlling offset weeds. Zashch. rast. ot vred. i bol. 9 no.4:
16-17 '64. (MIRA 17:5)

1. Institut sel'skogo khozyaystva Yugo-Vostoka.

SMIRNOV, B.M.

Electron transitions in chemical reactions. Zhur. eksp. i teor.
fiz. 46 no.2:572-582 F '64. (MIRA 17:9)

ACCESSION NR: AP4025933

S/0056/64/046/003/1017/1024

AUTHOR: Smirnov, B. M.

TITLE: Resonance charge exchange in slow collisions

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 46,
no. 3, 1964, 1017-1024

TOPIC TAGS: charge exchange, resonance charge exchange, slow collision charge exchange, ion atom collision, hydrogen like atom, electron level splitting, charge exchange cross section

ABSTRACT: Since perturbation-theory calculations yield the resonance charge exchange cross section only accurate to a pre-exponential factor, the author develops a method wherein this factor can be found in the case of an electron situated in the field of two Coulomb centers of charge Z (charge exchange in collision between an arbitrary ion and its own atom). In the case of slow collisions

Card

1/32

ACCESSION NR: AP4041435

S/0188/64/000/003/0038/0046

AUTHOR: Smirnov, B. M.

TITLE: The question of the Neuman — Wigner theorem

SOURCE: Moscow. Universitet. Vestnik. Seriya 3. Fizika, astronomiya, no. 3, 1964, 38-46

TOPIC TAGS: Neuman Wigner theorem, wave mechanics, energy level, electron distribution, electron symmetry, Schroedinger equation

ABSTRACT: The author presents an analysis of the Neuman - Wigner theorem. This theorem, which is applicable to a system whose hamiltonian is parameter-dependent, holds that the energy levels of states of identical symmetry do not intersect at any value of the parameter. It is noted that the validity of this theorem was placed in question with the appearance of the work of Gershteyn and Krivchenkov (ZHETF, 40, 1491, 1961), in which it was asserted that the terms of identical symmetry of an electron situated in the field of two Coulomb centers do, in fact, intersect. In the present paper, the theorem is analyzed, and the conditions under which it is violated are brought to light. In particular,

Card 1/2

ACCESSION NR: AP4042394

S/0056/64/047/001/0232/0239

AUTHOR: Smirnov, B. M.; Firsov, O. B.

TITLE: The interaction between negative ions and atoms

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 1, 1964, 232-239

TOPIC TAGS: negative ion energy, atom negative ion system, negative ion decay, ion decay cross section, resonance charge exchange, charge exchange cross section

ABSTRACT: The properties of a system resulting from a close encounter between an atom and a negative ion are investigated. It was assumed that interaction between an electron and an atom is significant in a restricted region of the order of atomic dimensions and that a weakly bound electron does not change the properties of an atom. The dependence of electron binding energy on the distance between the nuclei, when this distance is much greater than atomic size, was obtained. It appears that under certain conditions when an atom approaches a negative ion, the energy level of such a system (quasi-molecule) intersects with the boundary of a continuous spectrum.

Card

1/2

ACCESSION NR: AP4019223

S/0056/64/046/002/0578/0582

AUTHOR: Smirnov, B. M.

TITLE: Electron transitions in chemical reactions

SOURCE: Zhurnal eksper. i teor. fiz., v. 46, no. 2, 1964, 578-582

TOPIC TAGS: chemical reaction, electron transition, molecule interaction potential, proton hydrogen molecule reaction, deuteron hydrogen molecule reaction, muon hydrogen molecule reaction, three hydrogen atom system

ABSTRACT: The reaction $H + H_2$ is studied to analyze the electronic transitions which can occur in chemical reactions when the molecules of a nucleus collide. The collision energies under which an electronic transition is possible (under which crossing of terms is possible) is estimated. It is shown that the electron energy levels

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ACCESSION NR: AP4019223

of two states of the H_3 system intersect if the nuclei form an equilateral triangle. If an electronic transition occurs upon collision and one of the three atoms goes to infinity, then the remaining atoms are in a triplet state and the molecule will disintegrate. The potential of interaction between the atom and the molecule upon crossing is on the order of 1 eV. The cross section of the electron transition upon collision is proportional to the square root of the velocity. The electronic transition leads to a sharp redistribution of energy between the nuclei and this is of particular importance in the substitution reaction between muonium and a hydrogen molecule, since the same results are obtained if the proton is replaced by a deuteron or a positive muon. "The author is grateful to O. B. Firsov for a discussion of the work." Orig. art. has: 12 formulas.

ASSOCIATION: None

SUBMITTED: 22Jun63

DATE ACQ: 27Mar64

ENCL: 00

Cord 2/3

ACCESSION NR: AP4019223

SUB CODE: PH, CH

NO REF SOV: 001

OTHER: 007

Card. 3/3

ACCESSION NR: AP4043625

S/0056/64/047/002/0518/0523

AUTHOR: Smirnov, B. M.

TITLE: Resonance charge exchange in collisions of alkali atom metals

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 2, 1964, 518-523

TOPIC TAGS: resonance scattering, charge exchange, interaction ion, alkali metal, electron resonance

ABSTRACT: A general relation is established between the cross section for resonance charge exchange in a slow collision of an ion with its parent atom and the asymptotic form of the radial wave function of an electron in the atom. It is shown that knowledge of the characteristics of the atom makes it possible to determine the cross section of resonance charge exchange in the case when its value is much larger than the corresponding atomic value. Since

Card: 1/2

SMIRNOV, B.M.

Transitions on oscillatory levels due to collisions of molecules.
Dokl. AN SSSR 155 no.6:1294-1297 Ap '64. (MIRA 17:4)

1. Predstavleno akademikom M.A.Leontovichem.

L 12903-65 EWT(1)/EWC(2)/EPA(3)-2/EPA(w)-2/EEC(t)/T/EEC(b)-2/EWA(m)-2
 Pz-6/Pz-4/Pz-6/Pab-10/Pz-4 IJP(c) AT S/0051/64/017/004/0504/0514
 ACCESSION NR: AP4047173

AUTHOR: Smirnov, B. M.

TITLE: Inelastic collision of slow atoms

SOURCE: Optika i spektroskopiya, v. 17, no. 4, 1964, 504-514

TOPIC TAGS: slow atom, atomic collision, inelastic collision, K electron, L electron, interaction cross section

ABSTRACT: It is shown that the adiabatic approximation is violated in collisions between slowly moving atoms when the distance between the atoms is small. Small distances of this type are readily attained in collisions between light atoms, for the exchange of electrons give rise to a quasimolecule in which the translational velocities of the electrons are identical. The cross section for the inelastic interaction is determined completely by this exchange and is expressed in terms of the characteristics of the compound atom.

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L 12903-65

ACCESSION NR: AP4047173

This cross section consists of two parts. One predominates in the case of large velocities and decreases like $\sim v^8$ for s-s transitions. The other is connected with the finite masses of the nuclei and is a continuous function of the velocity (constant for s-s transitions). The result obtained can be used to study the ionization of the K or L electron by a heavy charged particle. In the limit when the nuclear charge of the incoming particle is small, the results obtained here coincide with that of W. Henneberg (Zs. Phys. v. 86, 592, 1933). By way of an example, the author calculates the cross section for the elastic transition and ionization of a proton on a hydrogen atom, and a charge exchange of a proton on a helium atom. "The author thanks O. B. Firsov for valuable remarks and for continuous interest." Orig. art. has: 15 formulas, 2 tables, and 1 figure.

ASSOCIATION: None

SUBMITTED: 24Jun63

ENCL: 00

Card 2/3

L 12903-65

ACCESSION NR: AP4047173

SUB CODE: NP

NR REF SOV: 007

OTHER: 011

Card 3/3

SMIRNOV, P. M.

Effect of elastic scattering on resonance charge exchange in
slow collisions. Dokl. AN S.S.S.R. 157 no. 2:325-327 J1 '64.
(MIRA 17:7)

1. Predstavleno akademikom M. A. Leontovichem.

SMIRNOV, B.M.; FIRSOV, O.B.

Interaction between negative ions and atoms. Zhur. eksp. i
teor. fiz. 47 no.1:232-239 J1 '64. (MIRA 17:9)

L 6718-65 EWT(m) DIAAP/AFWL/SSD/ESD(t)

ACCESSION NR: AP4042203

S/0020/64/157/002/0325/0327

AUTHORS: Smirnov, B.M.

TITLE: Effect of elastic scattering on resonance overcharging in a
slow collision

SOURCE: AN SSSR. Doklady*, v. 157, no. 2, 1964, 325-327

TOPIC TAGS: elastic scattering, resonance overcharging, slow
collision, impact parameter, collision cross section

ABSTRACT: In continuation of the work by D.R. Bates and A.H. Boyd, Proc. Phys. Soc. 80, 1301 (1962), the author obtains the general connection between the cross sections of resonance overcharging calculated with and without consideration of the elastic scattering. The results show that in the case of attraction between the colliding atomic particles, the cross section of the resonance overcharging increases because of the elastic scattering and capture, and decreases in the case of repulsion. The elastic scattering can be neglected, if at an impact parameter of about R_0 the interaction potential between the particles is much smaller than their kinetic

Card 1/2

L 6718-65

ACCESSION NR: AP4042203

energy. The author is deeply indebted to O.B. Firsov for valuable advice. Orig. art. has: 11 equations.

ASSOCIATION: None

SUBMITTED: 14Jan64

ENCL: 00

SUB CODE: NP

NR REF SOV: 004

OTHER: 001

Card 2/2

ACC NR: AM5022323

Monograph

UR/

Smirnov, B. M.

Negative ions of atoms; a survey (Otritsatel'nyye iony atomov; obzor)
Moscow, 1965. 93 p. illus., biblio. 150 copies printed.

Series note: Moscow. Institut atomnoy energii. [Doklady] IAE-810

TOPIC TAGS: ion, negative ion, ion interaction, ionization, surface ionization

PURPOSE AND COVERAGE: This book is intended for physicists, astrophysicists, geophysicists, and scientific personnel working in the field of plasma physics. It may also be useful to students specializing in atomic and nuclear physics. A review is made of recent progress in the field of negative ions and their relation to phenomena in low-temperature plasma, gas discharge, the upper atmospheric layers, and the atmosphere of the sun and stars. Among the topics considered are methods for determining the bond energy of electrons in negative ions, the affinity of atoms to the electron, the properties of a negative ion atom (the wave function of a weakly bonded electron, polarizability of the negative ion, its decay in a constant electric field), photo-decay of negative ions, radiative capture of an electron by an atom, and the processes taking place during the collision of negative ions

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ACC NR: AM5022323

with electrons, atoms, and positive ions. The author thanks O. B. Firsov and M. I. Chibisov for valuable discussions. There are 201 references, the majority of which are English.

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AVAILABLE: Library of Congress

SUB CODE: 20 / SUBM DATE: none / ORIG REF: 049 / OTH REF: 152

Card 4/4

L 24659-65 EPF(c)/EPA(w)-2/EWT(1)/EEC(t)/T/EWA(m)-2 Pr-4/Pab-10 IJP(c) WW
ACCESSION NR: AP5004386 S/0056/65/048/001/0133/0137

AUTHOR: Mordvinov, Yu. P.; Smirnov, B. M.

TITLE: Diffusion and mobility of ions in their parent gas

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 1, 1965, 133-137

TOPIC TAGS: ionization, ion diffusion, ion mobility, inert gas, charge exchange

ABSTRACT: The diffusion and mobility of the ions of an inert gas in the parent gas are calculated with account taken of resonance charge exchange and polarization capture of the pions by the atoms. Unlike in earlier work, the calculations are based on knowledge of the exact values of the resonance charge exchange cross section, with account taken of the dependence of the resonance charge exchange cross section of the ions with parent atoms on the elastic scattering and on the polarization capture of the ions; the latter factor is of considerable importance at low collision velocities. The calculations show that the diffusion and mobility of the ions in the parent gas are determined essentially by the resonance

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charge exchange of the ions even at low temperatures. The results obtained for the mobility of the ions at room temperatures are in good agreement with experiment. Summaries of the results are listed in Tables I and II of the enclosure. "The authors thank O. B. Firsoy for valuable discussions and interest in the work." Orig. art. has: 11 formulas and 2 tables.

ASSOCIATION: None

SUBMITTED: 14Mar63

ENCL: 02

SUB CODE: NP, GP

NR REF SOV: 006

OTHER: 011

Card 2/4

L 24659-65

ACCESSION NR: AP5004386

ENCLOSURE: 01

Average cross section, 10^{-16} cm^2

Gas	lgT, °K						
	2	2,5	3	3,5	4	5	6
H	94	70	64 78	56 68	48 61	38 47	27 34
He	46	34	27 46	23 42	20 38	17 28	11 22
Ne	58	42	34 54	28 48	24 44	18 34	12 26
Ar	108	82	67 96	56 90	49 83	38 73	28 63
Kr	132	101	83 119	72 111	63 104	50 92	38 79
Xe	143	108	88 140	75 134	65 126	50 112	37 98

Note: Upper line for each element - present data, lower line - data by others

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ENCLOSURE: 02

Mobility, $\text{cm}^2/\text{V}\cdot\text{sec}$

0

Gas	$T = 77^\circ \text{K}$	$T = 195^\circ \text{K}$	$T = 300^\circ \text{K}$
He	$\begin{Bmatrix} 15.1 \\ 13.5 \text{ [11]} \\ 13.8 \text{ [12]} \end{Bmatrix}$	$\begin{Bmatrix} 12.2 \\ 12.1 \text{ [11]} \\ 11.1 \text{ [12]} \end{Bmatrix}$	$\begin{Bmatrix} 10.9 \\ 10.8 \text{ [11]}, 9.6 \text{ [12]} \\ 10.5 \text{ [12]}, 10.7 \text{ [14]} \end{Bmatrix}$
Ne	$\begin{Bmatrix} 6.1 \\ 5.2 \text{ [11,12]} \end{Bmatrix}$	$\begin{Bmatrix} 4.3 \\ 4.5 \text{ [11,12]} \end{Bmatrix}$	$\begin{Bmatrix} 3.9 \\ 4.2 \text{ [11,12]}, 4.0 \text{ [12]} \\ 4.1 \text{ [14]} \end{Bmatrix}$
Ar	$\begin{Bmatrix} 1.92 \\ 2.2 \text{ [11]} \\ 1.88 \text{ [12]} \end{Bmatrix}$	$\begin{Bmatrix} 1.68 \\ 1.95 \text{ [11]} \end{Bmatrix}$	$\begin{Bmatrix} 1.41 \\ 1.6 \text{ [12,14]} \\ 1.63 \text{ [12]}, 1.38 \text{ [14]} \end{Bmatrix}$
Kr			$\begin{Bmatrix} 0.8 \\ 0.8 \text{ [12]} \\ 0.9-0.95 \text{ [17]} \end{Bmatrix}$
Xe			$\begin{Bmatrix} 0.56 \\ 0.58 \text{ [12]} \end{Bmatrix}$

Note: - Upper line for each element - present data, lower lines - data by others

Card 4/4

L 26981-65 EWT(1)/EWT(m)/EPA(sp)-2/EPF(c)/EPF(n)-2/EPR/EPA(w)-2/EEC(t)/T/EWP(t)/
EWP(b)/EWA(m)-2 Pz-6/Po-4/Pab-10/Pr-4/Ps-4/Pi-4/Pu-4 IJP(c) JD/AT
S/0057/65/035/001/0117/0122

ACCESSION NR: AP5003244

AUTHOR: Smirnov, B.M. / Chibisov, M.I.

TITLE: Resonance charge exchange in inert gases

SOURCE: Zhurnal tekhnicheskoy fiziki, v.35, no.1, 1965, 117-122

TOPIC TAGS: charge exchange, atom, ion, helium, neon, argon, krypton, xenon,
mathematical physics

ABSTRACT: The cross section for resonance charge exchange between a noble gas ion and its atom was calculated as a function of collision velocity for He, Ne, Ar, Kr and Xe, and the results were compared with experimental data from many sources. The formula of O.B.Firsov (ZhETF 21,1001,1951) and B.M.Smirnov (ZhETF 46,1017,1964) for the charge exchange cross section was employed. The calculations were performed in the one-electron approximation with asymptotic Coulomb wave functions which were normalized by fitting them to the corresponding Hartree-Fock wave functions at the boundary of the atom. It was found that the resonance charge exchange cross section depends only weakly on the angular momentum of the incident ion. Reasonably good

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ACCESSION NR: AP5003244

2

agreement with experiment was found, and it is concluded that the relatively simple Firsov model is adequate. "In conclusion, the authors express their deep gratitude to O.B.Firsov and I.P.Flaks for valuable remarks and their interest in the work." Orig.art.has: 9 formulas, 5 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 27Feb64

ENCL: 00

SUB CODE: NP

NR REF SOV: 012

OTHER: 021

Card 2/2

MORSE, V. M., SMIRNOV, A. B.

Diffusion and mobility of ions in their own gas. Zhur. eksp. i teor.
fiz. 43 no.1:133-137 Ja '65. (MIRA 18:4)

SHAROV, B.M.; CHIBIKOV, A.I.

Resonance charge exchange in inert gases. Zhur. tekhn. fiz. 35
no.1:117-122 Ja '65. (MIRA 12:3)

SMIRNOV, B.M.

Production and decay of negative ions. Dokl. AN SSSR 161 no.1:92-95
Mr '65. (MIRA 18:3)

1. Institut atomnoy energii im. I.V. Kurchatova. Submitted October
5, 1964.

I 12076-66 EWT(1)/T/EWA(m)-2 IJP(c)
ACC NR: AP6001776

AUTHOR: 44 55 Smirnov, B. M.; 44 55 Firsov, O. B.

ORG: none

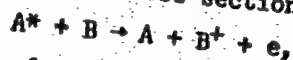
SOURCE CODE: UR/0386/65/002/010/478/482

TITLE: 21, 44, 55 Ionization of an atom colliding with an excited atom

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 10, 1965, 478-482

TOPIC TAGS: particle collision, ionization potential, excitation cross section, atomic structure

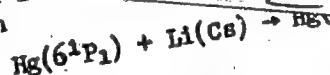
ABSTRACT: The authors calculate the cross section of the reaction



with the excitation potential of atom A exceeding the ionization potential I of atom B. The assumption is used that the cross section of transition (1) is determined essentially by collision impact parameters which greatly exceed the dimensions of the colliding atoms. Transition (1) is an important process occurring in the gas discharge of a gas laser. The authors show that if the atom A^* is in a resonant excited state from which a transition to the ground state via dipole radiation is possible, then the cross section of process (1) is larger than in the case

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decay of
the excited state
to the dipole-dipole
transition of the reaction



Card 2/3

L 12076-66

ACC NR: AF6001776

which plays a definite role in magnetohydrodynamic generators operating with a lithium (cesium)-mercury mixture. The values obtained for the photoionization cross sections of lithium and cesium at 1500K are $1.02 \times 10^{-14} \text{ cm}^2$ and $3.5 \times 10^{-15} \text{ cm}^2$, respectively. The large values of the cross sections offer evidence of the correctness of the method used in their determination. Orig. art. has: 9 formulas.

SUB CODE: 20/ SUBM DATE: 28Sep65/ ORIG REF: 004/ OTH REF: 006

CC
Card 3/3

SHIRNOV, B.M.; CHIBISOV, M.I.

Disintegration of atomic particles by an electric field and by
electron impact. Zhur. eksp. i teor. fiz. 49 no.3:841-851 S
'65. (MIRA 18:10)

L 04754-67 EWT(1) IJP(c) AT
ACC NR: AP6025949

SOURCE CODE: UR/0051/66/021/001/0019/0026

AUTHOR: Abramov, V. A.; Smirnov, B. M.

104

ORG: none

101

TITLE: Electron-ion recombination in plasma

B

SOURCE: Optika i spektroskopiya, v.21, no. 1, 1966, 19-26

TOPIC TAGS: ionized plasma, electron plasma, plasma charged particle, plasma density, plasma dynamics, plasma electron temperature, plasma interaction, plasma temperature, ion recombination, electron recombination, recombination coefficient, recombination emission, recombination radiation

ABSTRACT: The authors consider a plasma recombination process which involves the capture of an electron by an ion following the collision of an electron with another electron within the ion's field. One of the parameters describing certain kinetic processes in plasma is the electron-ion recombination coefficient, normally related to both electron and ion densities in plasma. At low electron densities, this coefficient is independent of electron concentration, whereas at higher electron densities the process of electron collisions in the ion fields becomes predominant, with the subsequent collisions occurring between the excited atom and free electrons, until the atom returns into its ground state. Since the energy changes in the captured electron

UDC: 533.9

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I 04754-67

ACC NR: AP6025949

3
occur in small increments, its distribution function is described by the Fokker-Planck equation. The recombination coefficient in this case is determined by the density of free electrons. The recombination of ions with electrons following electron collisions in a high temperature plasma is essentially an irreversible process accompanied by radiation at relatively high excitation states of the atom. If ionization in plasma is negligible compared to recombinations, the electron spends the major share of the time, needed for its return to the ground state, in the upper excitation levels. Consequently, the recombination coefficient is only slightly influenced by the individual characteristics of the atom, while depending strongly on the density and temperature of the plasma. The authors were able to derive a more accurate relation of the recombination coefficient to the properties of plasma over a wide range of temperatures and pressures. The effects of radiation by the excited atoms were also accounted for. The cross section of non-elastic electron collision with an excited atom was calculated using Born's approximation. In conclusion, the authors express their gratitude to M. A. Leontovich, V. I. Kogan and O. B. Firsov for the valuable assistance in the execution of this work. Orig. art. has: 31 formulas.

SUB CODE: 20/

SUBM DATE: 05Oct64/

ORIG REF: 010/

OTH REF: 003

Card 2/2

ACC NR: AP6033423

SOURCE CODE: UR/0057/66/036/010/1864/1871

AUTHOR: Smirnov, B.M.

ORG: none

TITLE: Mobility of ions in the parent gas

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 10, 1966, 1864-1871

TOPIC TAGS: positive ion, ion mobility, inert gas, cesium, charge exchange, kinetic equation, mathematic physics

ABSTRACT: The author derives formulas for the drift velocity under the influence of an electric field of ions in their parent gas. The calculations are based on the kinetic equation, and it is assumed that elastic scattering of the ions can be neglected in comparison with charge exchange collisions and that the charge exchange cross section is independent of velocity. Exact solutions of the simplified kinetic equation are obtained for the two limiting cases of low and high electric field strength, and a formula for the drift velocity in fields of intermediate strength is obtained by interpolation. The formula derived for ion mobility in weak fields is compared with the approximate formulas of Chapman and Enskog, and of Huxley and Compton; the mobilities given by both approximate formulas do not differ greatly from those given by the present "exact" formula. The drift velocities of helium, neon, argon, krypton, xenon, and cesium ions in their parent gases were computed for

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ACC NR: AP6033423

values of the ratio of the electric field strength to the pressure ranging from about 10 to 1000 V/cm mm Hg and the results are presented graphically, together with experimental data on the inert gases from different sources. The author does not comment on the agreement between the theory and experiment shown by these curves; all the experimental points lie slightly below the corresponding theoretical curves, i.e., the measured drift velocities are slightly lower than the calculated ones. The author thanks A.Ye.Bazhanova for performing the numerical computations. Orig. art. has: 30 formulas and 3 figures.

SUB CODE: 20

SUBM DATE: 23Oct65

ORIG. REF: 012

OTH REF: 008

Card 2/2

L 05776-67 EMT(1)

ACC NO: ~~AP~~031439

SOURCE CODE: UR/0056/66/051/002/0466/0474

AUTHOR: Smirnov, B. M.

29
B

ORG: none

TITLE: Excitation transfer in atomic collisions

SOURCE: Zh eksper i teor fiz, v. 51, no. 2, 1966, 466-474

TOPIC TAGS: atom, atom interaction, excited nucleus, particle interaction, particle collision, excitation cross section, diffusion coefficient

ABSTRACT: An asymptotically precise value of term splitting of an excited atom interacting with another atom is calculated for great distances between the atomic nuclei. The result obtained is used for determining the cross section for the excitation transfer from a metastable atom to a similar colliding atom in the ground state. The diffusion coefficient is calculated for metastable atoms in their own gas. Orig. art. has: 16 formulas. [Based on author's abstract]

SUB CODE: 20/ SUBM DATE: 22Jan66/ ORIG REF: 008/ OTH REF: 004/

Card 1/1 *egfr*

ACC NR: AT7004347

AUTHOR: Smirnov, B. M.

ORG: none

SOURCE CODE: UR/3136/66/000/085/0001/0056

TITLE: Recombination of positive ions in a plasma

SOURCE: Moscow. Institut atomnoy energii. Doklady, IAE-1085, 1966. Rekombinatsiya polozhitel'nykh ionov v plazme, 1-56

TOPIC TAGS: electron recombination, plasma charged particle, particle collision, recombination coefficient, electron temperature

ABSTRACT: This is a review article dealing with the recombination of positive ions with electrons or with negative ions in a plasma. The types of recombination considered are triple recombination, where the excess energy produced by the recombination is carried away by a photon, recombination of an electron and a molecular ion, where the excess energy is distributed among the degrees of freedom, and collisions between electrons and ions, when autoionization becomes possible. Other mechanisms considered are recombination of an atomic ion with an electron via formation of an autoionization state, recombination with negative ions, recombination of molecular ions, and transitions between atomic and molecular ions. In addition, triple collisions between the electrons, ions, and free particles are considered, and calculations are presented for the recombination coefficient with allowance for the photorecombination and the impact-radiative recombination accompanying it. The recombination co-

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Card 2/2

ACC NR: AP7003216

SOURCE CODE: UR/0056/66/051/006/1747/1750

AUTHOR: Smirnov, B. M.

ORG: none

TITLE: Transitions between atomic and molecular ions

SOURCE: Zh eksper i teor fiz, v. 51, no. 6, 1966, 1747-1750

TOPIC TAGS: gas ionization, impact ionization, electron recombination, electron collision, molecular structure

ABSTRACT: Making use of the analogy between the transformation of an atomic ion into a molecular one in triple collisions, on the one hand, and impact recombination of an electron and a positive ion in triple collisions, the author calculates the coefficient of transformation of the atomic ion into a molecular one, which is defined in analogy with the triple recombination coefficient. The particular process discussed is the transformation occurring in a gas discharge in which the gas temperature is appreciably lower than the dissociation energy of the molecular ion. The transitions between the atomic and molecular collisions are then determined by the polarization interaction between the ion and the atoms in the triple collisions. The polarization interaction between the ion and the atoms in the triple collisions. The polarization interaction between the ion and the atoms in the triple collisions. The polarization interaction between the ion and the atoms in the triple collisions.

ACC NR: AP7003216

participating). The formulas obtained for both cases agree well with experimental data from various sources. Orig. art. has: 1 figure and 7 formulas.

SUB CODE: 20/ SUBM DATE: 20Apr66/ OTH REF: 011

Card 2/2

SMIRNOV, B. N.: Master Med Sci (diss) -- "On the chemotherapeutic effect of sintomycin in experimental paratyphus infection, and its effect on the fever and inflammatory reactions". Leningrad, 1958. 18 pp (Inst of Experimental Med Acad Med Sci USSR), 200 copies (KL, No 1, 1959, 124)

SMIRNOV, B.N. (Leningrad)

Features of the course of experimental paratyphoid infection
during synthomycin therapy [with summary in English]. Pat.fiziol
i eksp.terap 2 no.4:10-14 JI-Ag '58 (MIRA 11:12)

1. Iz otdela obshchey patologii (zav. - chlen-korrespondent AMN
SSSR prof. P.N. Veselkin) Institut eksperimental'noy meditsiny AMN
SSSR.

(PARATYPHOID FEVERS, exper.

eff. of chloramphenicol in rabbits (Rus))

(CHLORAMPHENICOL, eff.

on exper. paratyphoid fevers in rabbits (Rus))

SMIRNOV, B.N.

Effect of synthomycin on inflammation and fever of aseptic origin.
[with summary in English]. Antibiotiki, 3 no.3:53-57 My-Je '58
(MIRA 11:7)

1. Otdel. obshchey patologii (zav. - chlen-korrespondent AMN SSSR prof.
P.N. Veselskin) Instituta eksperimental'noy meditsiny AMN SSSR.

(CHLORAMPHENICOL, effects,

on exper. fever & inflamm. prod. by aseptic method (Rus))

(FEVER, experimental,

aseptic, eff. of chloraphenicol. (Rus))

(INFLAMMATION, experimental,

(same))

Smirnov, B. N.

2755. DETERMINATION OF EFFICIENCY OF FLUE GAS EXHAUST FAN INSTALLATION.
Golitsky, V. I. and Smirnov, B. N. (Elekt. Sta. (Pwr Sta., Moscow), Mar.
1954, vol. 2, 11-12). The problem of assessing the economical operation
of flue gas pumping plant without subjecting the pumps to special tests,
i.e. without measuring gas discharges with various instruments, is examined.
To reduce the power consumed by draught it is necessary to ascertain fan
efficiency and to decide on the correct type of machine, the dimensions of
which will depend on the gas channel characteristics. Redesigning of fans
during boiler overhaul may also prove advisable. B.E.A.

62

①

SMIRNOV, B.N.

Hydrogeological conditions in the Yakovlevskoye iron ore
deposit. Razved. i okh. nedr 25 no.12:27-30 D '59.
(MIRA 13:6)

1. Upravleniy Tsentral'nykh rayonov.
(Kursk Magnetic Anomaly--Water, Underground)

SMIRNOV, B.N.

Methods of compiling hydrogeological and hydrochemical maps for
the Kursk Magnetic Anomaly and adjacent regions. Mat.po geol.i
pol.iskop.tsentr.raion.evrop.chasti SSSR no,5:178-182 '62.

(MIRA 16:6)

(Kursk Magnetic Anomaly region—Water, Underground maps)

SMIRNOV, B.N.

Methods of mapping the territory of the Kursk Magnetic Anomaly for purposes of hydrogeology, hydrochemistry, and engineering geology. (MIRA 16:4)
Sov.geol. 8 no.4:109-120 Ap '63. .

1. Geologos'yemoch'naya ekspeditsiya Geologicheskogo upravleniya Tsentral'nykh rayonov.
(Kursk magnetic anomaly—Geology—Maps)

SMIRNOV, B.N., inzh.

Investigation of the load carrying capacity of the foundation
of railroads with 750-mm rail gauge. Torf. prom. 38 no.8:10-
12 '61. (MIRA 14:12)

1. Tsentral'nyy nauchno-issledovatel'skiy institut mekhaniki i
energetiki.
(Railroad engineering--Tables, Calculations, etc.)

SMIRNOV, B. M.

Resonance charge-exchange in slow collisions. Zhur. eksp. i
teor. fiz. 46 no. 3:1017-1024 Mr '64. (MIRA 17:5)

SHINJAB IN 000

1. SHINJOI, B. I.

1. USSR (Sov)

4. Khar'kov - Apartment Houses; Buildings, Prefabricated

7. Experimental large apartment house with panel shell in Khar'kov. Bul. stroi. tekhn. 9 no. 7, 1952

Imperial Stalin'skoy revoliutsii. Nauchno-Issledovatel'skiy Institut Stroitel'noy Tekhniki Akademiya Arkhitektury SSR

9. Monthly List of Russian Accession, Library of Congress, August, 1952, UNCLASSIFIED

SMIRNOV, B.N.

MOROZOV, N.V., kandidat tekhnicheskikh nauk, laureat Stalinskoy premii;
Smirnov, B.N., inzhener.

Experience in building frame-panel and panel-built apartment
houses. Bet.i shel.-bet. no.3:80-88 Jo '55. (MIRA 9:1)
(Apartment houses) (Precast concrete construction)

SMIRNOV, B.N., laureat Stalinskoy premii, inzhener.

Constructing large-panel frameless apartment houses. Nov.v stroi.
tekh..no.4:43-56 '55. (MIRA 10:10)

1. Nauchno-issledovatel'skiy institut stroitel'noy tekhniki Akademii
arkhitektury SSSR.
(Precast concrete construction) (Apartment houses)

SMIRNOV, B.N., inzhener, laureat Stalinskoy premii; LINETSKIY, Ya.I., inzhener

Construction of an experimental large-panel frameless apartment. Mekh.
trud.rab. 9 no.4:16-21 Ap '55. (MLBA 8:7)
(Precast concrete construction)

SMIRNOV, B.N., laureat Stalinskoy premii.

Selection of structural design for large framed buildings.
Stroi. prom. 33 no.5:28-33 My '55. (MLRA 8:6)

1. Akademiya arkhitektury SSSR.
(Structural frames)

SMIRNOV, B.N.

Industrial installing of hidden electric wiring in large-panel
apartment houses. *Biul.stroi.tekh.* 13 no.11:19-22 N '56.

(MIRA 10:1)

1. Institut stroitel'noy tekhniki Akademii stroitel'stva i arkhitek-
tury SSSR.

(Electric wiring)

SMIRNOV, B.N.

SMIRNOV, B.N., inzh.

Building large-panel frameless apartment houses in Moscow, Bul.
stroil. tekhn. 14 no.12:1-8 D '57. (MIRA 11:1)

1. Nauchno-issledovatel'skiy institut zhillishcha Akademii stroitel'-
stva i arkhitektury SSSR.
(Moscow--Apartment houses) (Concrete slabs)

SMIRNOV, B.M., inzh.; Ass. V.Ye., arkhitekt, laureat Stalinskoy premii;
VOZHDAYEV, V.S., inzh.

Large-panel houses built of construction elements made on Con-
veying units. Zhil.stroi. no.4/5:22-24 '58. (MIRA 12:6)
(Moscow--Apartment houses)
(Concrete slabs)

5-10000, Boris Nikolaevich, [redacted], [redacted] (Moscow)

The architecture and structures in prospective apartment
building in the U.S.S.R. . . . A five-story building with optional
apartment system and external walls of plastic. Przegł budowl
budowlanych 38 no.10:556-563 0 164.

ACCESSION NR: AP4047984

S/0076/64/038/010/2455/2462

AUTHOR: Fialkov, A. S. ; Gumilevskaya, G. P. ; Chekanova, V. D. ; Smirnov, B. N. ;
Ogareva, N. N. ; Petukhova, R. P.

TITLE: The dependence of the change of pore structure of petroleum cokes on
coking temperature

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 10, 1964, 2455-2462

TOPIC TAGS: petroleum coke, pore structure, coking temperature, pore dimension

ABSTRACT: The change in the structure of the pores in petroleum coke coked at temperatures in the 600-3000C range was investigated. The total pore volume increased on increasing the coking temperature, and the relationship between the macropore and intermediate pore volume and the pore configuration changed. The total volume of micro and intermediate pores, which was minimum at coking temperatures of ~1200C, did not change with increasing temperature as fast as the total pore volume. Electron microscope studies confirmed that micropores

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ACCESSION NR: AP4047984

of 20-50 Å radius and intermediate channel-shaped pores of 100-200 Å radius existed in the petroleum coke. On coking to 1300C the dimensions of the micropores increased to 100 Å. The pore structure changed at 2900-3000C, the coke particles acquired a lamellar character and contained no micropores. The formation of the porous structure of the coke depended on gas evolution and on the two and three-dimensional orderliness of the coke material. Orig. art. has: 4 figures and 2 tables

ASSOCIATION: None

SUBMITTED: 25Aug63

ENCL: 00

SUB CODE: FP, MT

NO REF SOV: 007

OTHER: 002

Card 2/2

SMIRNOV, E. I.

Changes in the resistance to typhoid infection under the influence of the Bacillus mesentericus vaccine. Zdr. zhizn. i step. terap. 9 no.143-46 Jan-F '65. (Cib: 1511)

1. Otsel obshchey patologii (zav. - chlen-korrespondent ANU SSSR prof. F.N. Vashkin) Instituta eksperimental'noy meditsiny ANU SSSR, Leningrad).

L 36981-65 EWG(j)/EWP(e)/EWT(m)/EPF(c)/EWG(m)/EPR/EWP(t)/ENP(b) Pr-4/PS-4
S/0192/65/006/001/0066/0069 IJP(c) JD/WH/WH

ACCESSION NR: AP5007756

AUTHOR: Fialkov, A.S.; Baver, A.I.; Smirnov, B.N.; Chaykun, M.I.; Sidorov, N.M.;
Rabinovich, S.M.; Yurkovskiy, I.M.

TITLE: The structure of the various modification of pyrolytic carbon 17 23
32
B

SOURCE: Zhurnal strukturnoy khimii, v. 6, no. 1, 1965, 66-69

TOPIC TAGS: pyrolytic carbon structure, interboundary region, mosaic structure,
carbon anisotropy, carbon azimuthal disorientation, natural graphite structure, hydro-
carbon pyrolysis

ABSTRACT: The structure of pyrolytic carbon was studied by microstructural, electron-
microscopic, X-ray and microdiffraction analysis to determine the conditions of structure
formation, depending on the temperature, method of heating and atmosphere of the reac-
tion space. Various hydrocarbons (propane, butane, etc.) were used as sources. The
deposit was obtained by heating in a high-frequency induction furnace or by an exterior
heat source to temperatures above 2000C; further thermal treatment was carried out at
above 3000C. The presence of interboundary regions of a specific globular structure was

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detected which determine the structural anisotropy of the pyrolytic carbon. In specimens obtained under nitrogen, the interboundary regions were parallel, occurring at regular intervals. Occasionally, boundary regions showed specific chain-like outgrowths. Thermal treatment of pyrolytic carbon at temperatures above 3000C caused block formations in the recrystallized pyrolytic carbon of a mosaic-like substructure and regions of shifting dislocation; recrystallization led to a considerable decrease in the azimuthal disorientation. The high anisotropy was also seen in the roentgenogram. The carbon obtained at a temperature above 2000C in a vacuum (electric heat source) corresponded to the structure of amorphized natural graphite with a high degree of preferred crystal orientation (anisotropic factor about 30); the carbon obtained by pyrolysis in the vacuum induction furnace was more ordered than that obtained in a vacuum resistance furnace. Orig. art. has: 6 figures.

ASSOCIATION: None

SUBMITTED: 16Jan64

ENCL: 00

SUB CODE: OC

NO REF SOV: 003

OTHER: 007

mc
Card 2/2

SMIRNOV, B.N.

Fixation and multiplication of the pathogen in the isolated liver of the immune and non-immune body (pathogenesis of recurrence of paratyphoid fever infection following antibiotic therapy). Vest. AMN SSSR 18 no.2:60-67 '63. (MIRA 17:7)

1. Institut eksperimental'noy meditsiny AMN SSSR.

BORODZYUK, G.G.; STEPANOV, G.N.; DRIATSKIY, N.M.; IONTOV, L.Ye.; KOVALEV, S.M.; BLOKHIN, A.S.; DVORTSOV, L.D.; LUGOVSKOY, N.Ye.; MERKULOV, A.G.; SMIRNOV, B.P.; ROGINSKIY, E.M.; BALAN-II'YEVSKAYA, I.A.; IZRAILIT, S.G.; GRANAT, M.B.; ZARIN, S.A.; otv.red.; FEDOROVSKAYA, L.N., red.; MARKOCH, K.G., tekhn.red.

[Multichannel apparatus for high-voltage telephony on overhead lines and cables] Mnogokanal'naia apparatura vysokochastotnogo telefonirovaniia po vozdushnym i kabel'nym liniyam sviazi. Moskva, Gos.izd-vo lit-ry po voprosam sviazi i radio, 1959. 511 p.

(MIRA 14:1)

(Telephone--Equipment and supplies)

SMIRNOV, B.P., inzh.

Introduction of semiautomatic welding in an atmosphere of carbon
dioxide. Sudostroenie 26 no.2:53-56 (208) Feb '60. (MIRA 14:11)
(Electric welding)

SMIRNOV, B. P.

USSR/ Biology - Biochemistry

Card : 1/1

Authors : Sisakyan, N. M., Memb. Corres. of Acad. of Sc. USSR, and Smirnov, B. P.

Title : Bond forms between lipoids and protein complex of plastides

Periodical : Dokl. AN SSSR, 97, Ed. 3, 487 - 489, July 21, 1954

Abstract : Scientific data on the bond forms, existing between lipoids and the protein complex of plastides, are presented. The form of inter-metabolisms of various lipoids during the development of the organism was investigated to determine the chemical nature and the biochemical functions of plastides. Four USSR and 2-German references. Table, graph.

Institution : Acad. of Sc. USSR, The A. N. Bakh Institute of Biochemistry

Submitted : May 18, 1954

SMIRNOV, B.I.:

SMIRNOV, B.P.: "Biochemical transformation of the lipoids of chloroplasts".
Moscow, 1955. Inst of Biochemistry imeni A.N. Bakh, Acad Sci USSR.
(Dissertations for the Degree of Candidate of Biological Sciences)

SO: Knizhnaya letonis' No 44, 29 October 1955. Moscow

SMIRNOV, B. P.

The synthesis and oxidation of fatty acids in isolated chloroplasts. N. M. Sisakyan and B. P. Smirnov (A. N. Bakh Inst. Biochem., Acad. Sci. U.S.S.R., Moscow). *Biokhimiya* 21, 273-8 (1956). The study materials were: red clover, sunflower, sugar beet, and beans. Lipide analyses were made on chloroplasts isolated by method I and chloroplasts from the leaves of bean sprouts to be used for fatty acid oxidation studies were isolated by method II of S and S (C.A. 50, 12195f). For the study of the synthesis of fatty acids whole chloroplasts were isolated from the cotyledons of sunflower sprouts and from the leaves of bean sprouts. The vegetable material was ground in a porcelain mortar with a K phosphate buffer of pH 6.0 in 0.3M soln. of sucrose. At pH 6.0 the nuclei disintegrated thereby facilitating the isolation of the free chloroplasts. The homogenate was pressed through linen cloth, slowly centrifuged 4 times for 3 min. to separate the cell fragments and the starch granules, or it was filtered through a No. 1 or No. 2 glass filter. The supernatant was then centrifuged at 700 g for 5 min. to bring down the chloroplasts. Sediment was again resuspended in K phosphate buffer of pH 7.0 and again centrifuged 2% of the total of chloroplasts thus isolated constituted 2% of the total of the plant material used. They were examined by electron microscope and cytologically. Lipides were extd. from the chloroplasts by the method of S and S (C.A. 48, 13829f); fatty acid detns. in the lipides were made by a generally accepted method. Acetate with C^{14} in the carboxyl group was employed in the study of fatty acid synthesis. Fatty acids constitute an av. of 50% of the lipid substances of the chloroplasts. During the incubation of chloroplasts isolated from the cotyledons of sunflower sprouts with

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Sisakyan, N.M. - Smirnov, B. P.

acetone having C^{14} in the carboxyl group the inclusion of CH_3CO_2H into the fatty acids of the chloroplast lipides was demonstrated. The inclusion of labeled acetate into the chloroplast lipides of bean sprouts under similar conditions was not observed. Chloroplasts possess the capacity to oxidize higher fatty acids: linoleic, linolenic, oleic, and palmitic. In the bean chloroplasts were found 2.1 units of coenzyme A or 5.1 γ of coenzyme A/g. of dry substance.

B. S. Levine

2/2

SMIRNOV-BP.

Paths of synthesis of phospholipides in chloroplasts in vitro. N. M. Sisakyan and B. P. Smirnov (A. N. Bakh Biochem. Inst., Moscow). *Doklady Akad. Nauk S.S.S.R.* 107, 449-51(1956).—Synthesis of phospholipides in kidney-bean chloroplasts was followed by means of P^{32} -tracer *in vitro*, after isolation of chloroplasts by particulation of leaves in aq. sucrose and centrifuging. The chloroplasts were incubated in soln. of $Na_2HP^{32}O_4$ for desired periods, and the action was stopped by CCl_3CO_2H . Examn. of phospholipide fraction showed that its content varies during the day, being max. during daylight hours; acid-sol. P also follows this pattern. No introduction of P^{32} into phospholipide fraction took place on incubation of chloroplasts with Na_2HPO_4 alone. Addn. of adenylic acid, di-K succinate, glycerol, and $Na_2HP^{32}O_4$, however, resulted in incorporation of P^{32} in 2 hrs. Adenylic acid was found to be the essential component of the mixt. for this reaction.

G. M. Kosolapoff.

2

SMIRNOV, B.P.; IVANOVA, R.P.

Effect of calcium ions on the respiration of isolated
chloroplasts. Izv.Kar.i Kol'.fil.AN SSSR no.4:76-81 '59.
(MIRA 13:5)

1. Laboratoriya biokhimii lipidov Instituta biologii Karel'skogo
filiala AN SSSR.
(Chromatophores) (Calcium--Physiological effect)

SMIRNOV, B.P.; POPOVA, R.A.; NISKANEN, R.A.

Quantitative paper chromatography of higher fatty acids in the form
of methyl esters ($R.C.OO.C_{14}H_3$). Biokhimiia 25 no.2:368-375 Mr-Ap
'60. (MIRA 14:5)

1. Laboratoriya biokhimii lipidov Instituta biologii Karel'skogo
filiala Akademii nauk SSSR, Petrozavodsk.
(ACIDS, FATTY) (PAPER CHROMATOGRAPHY)

SMIRNOV, B.P.

Biosynthesis of higher fatty acids from acetates in isolated
chloroplasts of *Spinacia oleracea* leaves. *Biokhimiia* 25
no. 3:545-555 My-Je '60. (MIRA 14:4)

1. Laboratory of Lipid Biochemistry, Institute of Biology, the
Karelian Branch of Academy of Sciences of the U.S.S.R., Petrozavodsk.
(FATTY ACID METABOLISM) (ACETIC ACID) (PLANTS---METABOLISM)

SMIRNOV, B.P., SIDOROV, V.S.

Paper chromatography of resin acids from pine and spruce. Zhur.
prikl.khim. 33 no.5:1192-1203 My '60. (MIRA 13:7)

1. Laboratoriya biokhimii lipidov Instituta biologii Karel'skogo
filiala AN SSSR, Petrozavodsk.
(Resin acid) (Paper chromatography)

SMIRNOV, B. P. (US3R)

"Photosynthetic Acetylation in Chloroplasts in Vitro."

Report presented at the 5th Int'l. Biochemistry Congress,
Moscow, 10-16 Aug 1961.

SMIRNOV, B.P.

Photosynthetic acylation in chloroplasts in vitro. Biokhimiia 27
no.1:154-160 Ja-F '62. (MIRA 15:5)

1. Laboratory of Lipid Biochemistry, Institute of Biology, the
Karelian Branch of the Academy of Sciences of the U.S.S.R.,
Petrozavodsk.

(CHROMATOPHORES) (PHOTOSYNTHESIS)
(ACYLATION)

SMIRNOV, B.P.; POPOVA, R.A.; DANILOVA, G.P.; NISKANEN, R.A.

Paper chromatography of bile acids in the form of methyl esters
(R. COO.C¹⁴H₃). Biokhimiia 27 no.2:197-201 Mr-Apr '62.

(MIRA 15:8)

1. Laboratory of Lipid Biochemistry, Biological Institute of the
Carelian Branch of Academy of Sciences of the U.S.S.R., Petrozavodsk.
(PAPER CHROMATOGRAPHY) (BILE ACIDS)

SMIRNOV, B.P.

Quantitative paper chromatography of organic compounds as
methyl ethers with tagged carbon. Trudy Kom. anal. khim. 13:435-445
'63. (MIRA 16:5)

1. Institut biologii Karel'skogo filiala AN SSSR, Petrozavodsk,
laboratoriya biokhimii lipidov.
(Ethers) (Paper chromatography) (Carbon isotopes)